

REMARKS:

The foregoing amendments correct two translation errors in Table C-1 on page 87 of the specification. Namely, Applicants amend the phrase “Difference in surface resistivities between front and rear surfaces” in the fourth cell from the bottom of Table C-1 to read “Difference between rear surface resistivity and front surface resistivity.” Similarly, Applicants amend the phrase “Difference in surface resistivities between front and rear surfaces” in the third cell from the bottom of Table C-1 to read “Difference between front surface resistivity and volume resistivity.”

In the foregoing amendments, Applicants amend claims 7 and 16 by further defining the "aromatic tetracarboxylic acid derivatives" as aromatic tetracarboxylic dianhydrides or aromatic tetracarboxylic acid diesters mixed at a specific ratio. This amendment finds support on page 30, line 34 to page 31, line 11 of the present specification and previously presented claims 9 and 11, which Applicants cancel. At the present time, claims 1-8, 10, and 12-32 pend in the application. In a previous Office Action, the Examiner withdrew claims 1-6 and 17-32 from consideration as being directed to a non-elected invention. Claim 7, 8, 10, and 12-16 remain in the application for consideration by the Examiner. Applicants respectfully request reconsideration and allowance of claims 7, 8, 10, and 12-16 for reasons that follow.

On pages 2-3, the Office Action included a rejection of claims 7 and 12 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 5 of copending Application No. 12/441,980. In the foregoing amendments, Applicants amend claim 7 by incorporating the limitations of previously presented claims 9 and 11 therein. Claim 12 depends from claim 7. Previously presented claims 9 and 11 were not included in this double patenting rejection, which infers that the limitations in claims 9 and 11 are patently

distinguishable from claims 1 and 5 of copending Application No. 12/441,980. At least for this reason, Applicants respectfully submit that the double patenting rejection of claims 7 and 12 is now moot and/or amended claim 7 and claim 12 that depends thereon are patently distinguishable from claims 1 and 5 of copending Application No. 12/441,980. Therefore, Applicants respectfully request that the Examiner reconsider and withdraw this rejection.

On pages 3-4, the Office Action included a rejection of claims 7-8, 10, and 12 under 35 U.S.C. §102(b) as being anticipated by Paul (US 5,138,028). In the foregoing amendments, Applicants amend claim 7 by incorporating the limitations of previously presented claims 9 and 11 therein. Claims 8, 10, and 12 depend from claim 7. Previously presented claims 9 and 11 were not included in this §102 rejection, which infers that the limitations in claims 9 and 11 are not anticipated by Paul. At least for this reason, Applicants respectfully submit that the §102 rejection of claims 7-8, 10, and 12 over Paul is now moot and/or amended claim 7 and claims 8, 10, and 12 that depend thereon are patently distinguishable from Paul under 35 U.S.C. §102(b). Therefore, Applicants respectfully request that the Examiner reconsider and withdraw this rejection.

On pages 5-6, the Office Action included a rejection of claims 9 and 11 under 35 U.S.C. §103(a) as being unpatentable over Paul in view of Hasegawa (*Structure and Properties of Novel Asymmetric Biphenyl Type Polyimides* in *Macromolecules*, Vol. 32, No. 2, pp. 387-396, 1999) as evidenced by Wilson (Polyimide, Blackie & Son Ltd., 1990, pg. 1-2, scheme 1.2). As mentioned above, Applicants amended claim 7 to include the limitations of claims 9 and 11. Accordingly, this rejection now appears pertinent to amended claim 7. On pages 6-7, the Office Action included a rejection of claim 13 under 35 U.S.C. §103(a) as being unpatentable over Paul in view of Kanetake (US 6,303,054). On pages 7-8, the Office Action included a rejection of

claims 7 and 14-16 under 35 U.S.C. §103(a) as being unpatentable over Kanetake and Paul. Applicants respectfully submit that the teachings of Paul, Hasegawa, Wilson, and/or Kanetake do not disclose or suggest the inventions defined in claims 7, 8, 10, and 12-16 within the meaning of 35 U.S.C. §103 for at least the following reasons.

Applicants' claim 7 is directed to a semi-conductive aromatic amic acid composition comprising, *inter alia*:

an aromatic amic acid oligomer obtained by polycondensation of at least two aromatic tetracarboxylic acid derivatives and an approximately equimolar amount of aromatic diamine; carbon black; and an organic polar solvent,

wherein said at least two aromatic tetracarboxylic acid derivatives are a mixture of 15 to 55 mole% of an asymmetric aromatic tetracarboxylic dianhydride and 85 to 45 mole% of a symmetric aromatic tetracarboxylic dianhydride or a mixture of 15 to 55 mole% of an asymmetric aromatic tetracarboxylic acid diester and 85 to 45 mole% of a symmetric aromatic tetracarboxylic acid diester.

The Specification describes that only the use of symmetric aromatic tetracarboxylic acids or esters thereof induces crystallization of a polyimide film that avoids film forming, thereby causing powderization of the film during heat treatment (Spec. 31, ll. 12-22). Although use of only asymmetric aromatic tetracarboxylic acids or esters thereof achieves the formation of a seamless tubular PI film, such an obtained film has an inferior yield stress and elastic modulus, and when used as a rotational belt, it suffers from problems such as low driving responsiveness and early elongation of the belt (Spec. 31, ll. 12-22). The presently claimed invention solves these problems of the prior art. In particular, the presently claimed combined use of aromatic tetracarboxylic acids or esters thereof at a specific mixing ratio achieves extremely high film-

forming capability (formability) and provides a semi-conductive seamless tubular PI film having a high yield stress and elastic modulus (Spec. 30, l. 34 – 31, l. 27). The teachings of Paul, Hasegawa, Wilson, and Kanetake, either alone or in combination, do not disclose or suggest the inventions having the properties and/or structures as required in claims 7, 8, 10, and 12-16 within the meaning of 35 U.S.C. §103.

Consider the teachings of Paul. Claim 1 of Paul proposes a polymerizable oligomer such as a polyamic acid, the polymerizable oligomer being end-capped with a diaryl-substituted polyamic acid (DASA). Paul further proposes a composition comprising the polymerizable oligomer and states that carbon black may be incorporated in the composition (col. 12, l. 1).

Paul, in passing, discusses asymmetric tetracarboxylic acids, such as naphthalene-1, 2, 4, 5-tetracarboxylic anhydride, and symmetric tetracarboxylic acids, such as 3,3',4,4'-benzophenonetetracarboxylic anhydride, among a shotgun disclosure of tetracarboxylic acids (col. 7, ll. 3-43). However, the examples of Paul only use one or two types of symmetric tetracarboxylic acids – not asymmetric tetracarboxylic acids. More importantly, the examples of Paul nowhere described the use of a mixture of an asymmetric tetracarboxylic acid and a symmetric tetracarboxylic acid, as required in the present claims. In other words, the teachings of Paul attached no importance or significance to the use of a mixture of an asymmetric tetracarboxylic acid and a symmetric tetracarboxylic acid, as presently claimed. For these reasons, the teachings of Paul cannot have any description or suggestion of using an asymmetric aromatic tetracarboxylic dianhydride (or an ester thereof) and a symmetric tetracarboxylic dianhydride (or an ester thereof) at a specific mixing ratio, as required in the present claims.

Furthermore, Paul proposes DASA containing a linking group selected from the group consisting of -NH₂, CHO, isocyanate, (acid) anhydride, carboxylic acid, ester, and acyl halide

(see Claim 1, etc.). Paul further proposes that the DASA-capped oligomers are prepared by co-reacting stoichiometric equivalents of one or more diamines with one or more tetracarboxylic acid dianhydrides and at least one DASA end cap reagent (col. 9, ll. 3 – 8). For example, when the DASA end cap reagent contains an amino group as a linking group, the total amount of the diamine and the DASA end capped reagent containing the amino group should be equal to the amount of tetracarboxylic acid dianhydride. In other words, within the teachings of Paul, *it is necessary to use tetracarboxylic acid dianhydride in an excess amount relative to diamine*, in contrast to the present claims. More specifically, since the oligomer of uses a DASA end cap reagent, the diamine and the tetracarboxylic acid derivative cannot be used in approximately equimolar amounts, as required in the present claims. In contrast to the teachings of Paul, the aromatic amic acid oligomer of the presently claimed invention is obtained by polycondensation of at least two aromatic tetracarboxylic acid derivatives and “an approximately equimolar amount” of aromatic diamine. At least for these reasons, the presently claimed invention is patently distinguishable from the teachings of Paul.

Paul further proposes a composite prepared by combining reinforcing fibers with the polymerizable oligomer of claim 1 therein, a molded article prepared from a composition comprising the polymerizable oligomer of claim 1 therein, and an adhesive containing the oligomer of claim 1 therein. However, Paul simply does not contemplate or suggest forming a seamless tubular film in accordance with the presently claimed invention.

The Office Action stated Paul proposes a stoichiometric ratio of dianhydrides with diamines in a polar solvent such as NMP (col. 9, ll. 4-6, 54). However, this solution is used in the production of the oligomer, and such a solution does not correspond to the compositions defined in Applicants’ claims. Accordingly, Applicants submits that any discussion concerning

solutions of NMP in Paul is not relevant to the presently claimed invention and/or does not provide a nexus between the teachings of Paul and the presently claimed invention that could provide any person skilled in the art with a reason to make a semi-conductive aromatic amic acid composition as presently claimed. Similarly, Applicants respectfully submit that there is no identity of invention between the teachings of Paul and the presently claimed invention, and therefore the “semi-conductive” property of the presently claimed invention cannot be inherent in the teachings of Paul and, in fact, patently distinguish the presently claimed invention from the teachings of Paul.

The teachings of Hasegawa and Wilson do not cure or rectify the aforesaid deficiencies in the teachings of Paul. Hasegawa proposes a polyimide prepared by blending a polyamic acid A comprising a symmetric dianhydride (s-BPDA) and a diamine, and a polyamic acid B comprising an asymmetric dianhydride (a-BPDA) and a diamine. The Hasegawa process allegedly improves the thermal characteristics of a polyimide comprising BPDA/diamine. Hasegawa further proposes that the polyimide can be used in films. The Office Action cited Wilson as disclosing that the reaction of forming polyamic acid is a reversible process and concluded that the blend of Hasagawa can also produce a polyamic acid that is equivalent to that of Applicants’ invention.

The Office Action proffered that the teachings of Hasegawa could produce a polyimide equivalent to that of Applicants’ claims. However, when a polyamic acid comprising a symmetric aromatic tetracarboxylic acid and a polyamic acid comprising an asymmetric aromatic tetracarboxylic acid are individually synthesized and a polyimide is prepared by blending these polyamic acids, the resulting polyimide has a high molecular weight and is thus highly viscous, making a uniform dispersion of carbon black therein impractical. Accordingly,

even if the polyimide proposed by Hasegawa is used in the method of Paul, one of ordinary skill in the art would have no reason to expect that carbon black could be sufficiently or uniformly dispersed therein. Accordingly, the combination of Paul and Hasegawa can provide no reason for or lead one of ordinary skill in the art to a semi-conductive seamless tubular polyimide film that necessarily should have uniform electrical resistivity and/or to the presently claimed invention.

As explained above, the composition proposed by Paul is not an aromatic tetracarboxylic acid oligomer comprising tetracarboxylic acid derivatives and an aromatic diamine in approximately equimolar amounts, as presently claimed. Therefore, even if the polyimide of Hasegawa is combined with the method of Paul, such a combination cannot suggest a semi-conductive aromatic amic composition comprising an aromatic amic acid oligomer obtained by the polycondensation of at least two aromatic tetracarboxylic acid derivatives and in approximately equimolar amount of at least one aromatic diamine, as presently claimed, which composition has remarkable effects and properties as discussed above.

The teachings of Kanetake do not cure or rectify the aforesaid deficiencies in the teachings of Paul, Hasegawa, and Wilson. For example, the Office Action did not include the teachings of Kanetake in any rejection of previously presented claims 9 and 11. Since pending claims 7 and 16 include the limitations of canceled claims 9 and 11, Applicants respectfully submit that the teachings of Kanetake are not pertinent to amended claims 7 and 16 and add nothing to the teachings of Paul, Hasegawa, and Wilson.

For at least the foregoing reasons, Applicants respectfully submit that claims 7, 8, 10, and 12-16 are patentably distinguishable from the teachings of Paul, Hasegawa, Wilson, and/or Kanetake. Therefore, Applicants respectfully request that the Examiner reconsider and withdraw the §103 rejections of claims 7, 8, 10, and 12-16 over these teachings. Since claims 7, 8, 10, and 12-16 are in condition for allowance, Applicants respectfully request the rejoinder of withdrawn claims 1-6 and 17-32 with claims 7, 8, 10, and 12-16 and an allowance of all these claims.

Applicants believe that the foregoing is a complete and proper response to the Office Action mailed July 1, 2009. While it is believed that all claims in this application are in condition for allowance, if the Examiner has any comments or questions, Applicants invite the Examiner to telephone the undersigned at the below listed number to resolve any outstanding issues.

In the event this paper is not timely filed, Applicants hereby petition for an appropriate extension of time. The fee therefore, as well as any other fees which become due, may be charged to our Deposit Account No. 50-1147.

Respectfully submitted,

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